SOME THEORETICAL AND PRACTICAL ASPECTS OF EDUCATIONAL PORTAL DESIGN BASED ON CMS SYSTEM

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***Abstract**: In this paper the authors describe and review their own experience as well as the experience of other countries in the use of of CMS for the development of educational portals. In addition, the paper includes a preview of system side requirements for such CMS as Joomla!, Drupal, WordPress, PHP-Fusion, Web@all CMS, Mambo and eXtreme-Fusion. The authors propose a concept of an educational portal that meets the needs of students, academic teachers, lecturers and administrative staff of the university. A description of the layers and target groups of this educational portal is provided, too. Moreover, the article examines results of a student survey relating to their expectations concerning the faculty's educational portal. The last section of the article provides advice for designers of CMS-based portals, based on the authors' many years of experience in the field and an analysis of the available examples.*

Keywords: CMS, Joomla!, Drupal, educational web-site, web-based learning environment, CMS users' authorization levels.

INTRODUCTION

Until recently the development of thematic portals has been a very complex task requiring developers to have advanced programming knowledge in the field of software development for web sites. Free software developers were first to realise these deficiencies, so they embarked on Creating Free Software content management systems (Content Management System) in short called CMS. A CMS should be understood as a platform allowing the user to build on their own information service or an Internet portal based on

the pre-developed modules. The most well-known and popular CMSs include: Drupal, Joomla, Wordpress, Mambo and others. The Apache PHP Nuke is still used although it has lost some of its popularity.

1. REVIEW OF SOME EXPERIENCES IN THE AREA OF USING CMS

1.1. Some CMS experience in Poland

Depending on the specific type of CMS, the number of modules is different, but in all CMSs the following tools are always available: news, FAQ, Download, Links, Search, Surveys, and many others. To this list one can add other modules downloaded from the Internet or developed by oneself. Each module can be disabled at any time, or its availability will be limited to selected users. Blocks are elements of web pages that are displayed in the form of an independent frame. Modules are examples of such blocks (Smyrnova-Trybulska 2005, 2012). Today, access to various IT systems to support the content management – Content management System (CMS) (including Open Source such as Drupal, Joomla!, WordPress, etc.), the use of which does not require advanced programming skills, yet they provide a wide range of different functions and capabilities of their use, for example, educational resources can be placed on the portal server (news, articles, notes, papers, didactic multimedia materials and other projects, including possibility of copying on your computer (download)), creating a catalogued Internet resource links to support the theme, a discussion forum, chat, creating a glossary of terms, concepts (general and thematic), a vote (poll) on the topic of interest and much more. To participate in the development of this interesting and useful resource, you can bring the entire class of students or schools, but especially teachers, each of whom can find out the information and educational resources and services to interact and communicate (Chat, Forum, an internal messaging system, etc.) with users of the portal on your subject. An example might be sites such as http://erudyta.weinoe.us.edu.pl, www.interklasa.pl, www.profesor.pl, etc. The positive side of using this method is teachers' and students' knowledge of useful and modern multi-purpose tools as these systems are available, as well as the possibility of creating an educational portal of school or region that presents the achievements of the institution or region, as well as links to the most interesting and useful Internet resources.

For example, more and more Polish schools and universities are using CMS for developing their school web-sites:

- http://www.zs4.wroc.pl/joomla/index.php, http://www.zs2-gostynin.edu.pl/index.php?option=com_frontpage&Itemid=1, http://www.gim1.cieszyn.pl/, http://www.sp1.mielec.pl/index.php?option=com_frontpage&Itemid=1, other (based on CMS Joomla!);
- http://www.us.edu.pl, http://www.weinoe.us.edu.pl, http://krolowka.com/, other (based on CMS Drupal)
- http://www.szkola-liderow.pl/index.php, http://www.akcjadobrapolskaszkola.com/art/, other (based on CMS WordPress)

1.2 CMS experience in other countries

Currently, the use of CMS systems is global and universal. They are used, for example, for educational purposes, research, publishing, business, by librarians etc. Included below are a number of examples of CMS use in other countries as well as an analysis of the results of certain studies.

The study *"Web-based Learning Environments: Current Pedagogical and Technological State* (Mioduser, Nachmias, Lahav 2000) proposes and analyses a classification scheme which was developed and implemented for the study of 436 *educational Web sites* focusing on mathematics, science, and technology learning. Results indicate that many *educational Web sites* are still predominantly text-based and do not yet exhibit evidence of current pedagogical approaches. Suggestions for future Web-based learning environments are provided.

The study (Miles 2002) evaluated the science, mathematics, and technological needs of teachers in eastern North Carolina, establishing how to best serve their professional development needs. A survey instrument was constructed to collect information from North Carolina teachers who served as Professional Development Liaisons (PDLs). The survey consisted of 11 questions pertaining to general information about the teacher, teacher professional development needs, and Eastnet, an *educational Web site* for eastern North Carolina teachers. Analysis of data from 103 surveys and from follow-up interviews with 14 teachers indicated that the top three professional development items respondents mentioned needing the most were in the areas of *educational* technology, curriculum development, and inquiry. Most respondents indicated that the topic and location of the professional development workshop were the main factors deciding whether they attended. Over half of the respondents indicated that the best time for them to attend professional development workshops was during professional development days. The themes of *educational* technology and grant writing emerged during the follow-up interview.

The authors (Barnes, Fluke, Jones 2008) adopt the Web 2.0 paradigm as a mechanism for preparing, editing, delivering and maintaining educational content, and for fostering ongoing innovation in the online education field. Author reports on the migration of legacy course materials from "PowerPoint" slides on CD to a fully online delivery mode for use in the "Swinburne Astronomy Online" (SAO) program. Was to adopt a widely used, web based content management system, "Drupal," a web based media management system, "Coppermine," and own plug in code. Together, these form the basis of an entirely browser based course development and deployment infrastructure. In own report the author describe the new Web 2.0 SAO system, the "Virtual Cadet," which they developed to simplify content migration, and the "SAO Viewer," which is used by students to access the course material. They compare the merits of the "PowerPoint" and Web 2.0 formats of SAO, and describe the future innovations that are enabled by the move to web based content delivery. The arrival of Web 2.0 empowers content developers by rendering en-mass conversions of legacy content into web based content economically sensible, with potential for enhancing learning and teaching.

The study "Incorporating Competency-Based Blended Learning in a Chinese Language Classroom: A Web 2.0 Drupal Module Design" aims to create a blended learning environment, based on the concept of competency-based training, in a Chinese as a Foreign Language (CFL) classroom at an American university (Huang, Lin, Chiang, Yueh-Hui 2010). Drupal platform and web 2.0 tools were used as supplements to traditional face-to-face classroom instruction. Students completed various selective tasks and assignments and received the instructor's feedback through several online modules. Students and the instructor were polled at the end of the semester so that their opinions and experiences could be gathered and analysed. The findings revealed that the instructor and students alike responded positively to blended learning, suggesting that web 2.0 is a promising tool in promoting effective learning of Chinese.

The research "Rhetorical Savvy as Social Skill: Modeling Entrepreneur Identity Construction within Educational Content Management Systems" (Spartz 2010) focuses on one aspect of rhetorical training that writing instructors have an opportunity--if not an obligation--to inculcate (or at least introduce) in students studying to be entrepreneurs and taking their writing classes. Specifically, through the use of an open source Content Management System (CMS) (e.g., Drupal or Moodle), instructors are able to model, foster, and provide a safe place for students to practice constructing or cultivating an

"ethos," an entrepreneurial identity(ies) in response to the social demands of the course, its projects, and this disruptive technology itself.

The purpose of other research study (Ballard 2010) was to understand the construct of usability from the perspective of 74 students enrolled in six online courses offered by one online and distance learning program at a large, public university in the Midwest. Six courses, designed and developed by two different groups, professional and nonprofessional developers, were selected. The study used both quantitative and qualitative measures to record the experiences of students enrolled in the six online courses. First, the courses were evaluated using Nielsen's (1994, 2000, 2002) heuristics as operationalised by the "Xerox Heuristic Evaluation Checklist" (1995) as a standard measure of usability, then rank-ordered by heuristic evaluation score. Eachus and Cassidy's (2006) "Computer Use Self-efficacy Scale" was used as a pre-course survey to measure students' computer self-efficacy prior to beginning their online course. Stewart, Hong, and Strudler's (2004) "Quality of Web-based Instruction" was used as a post-course survey to measure student satisfaction with their online course experience. Among outcomes research was remarks the correlation between the self-efficacy score and error rate means was nonsignificant. The correlation between self-efficacy and error rate was small; very close to zero. There was a small positive correlation between student satisfaction and usability as measured by error rates. Based on the analysis of the study variables according to course development type, the results of this study found that Nielsen's usability heuristics, a respected evaluation tool used primarily to measure the usability of commercial web sites, can be used to evaluate instructional web sites and used to differentiate between levels of usability in the same way usability is judged by students.

The authors of the research (Willis, Baron, Lee 2010) look at the process of collaboratively creating and disseminating information resources, such as journals, books, papers, and multimedia resources in higher education. This process has been facilitated and encouraged by two relatively new movements, open-source and, especially, open access. The most definitive expression of the principles of open access is the Budapest Open Access Initiative. This study explores the different approaches to both creating and disseminating information resources for higher education and evaluates some of the most commonly used software options for supporting these activities.

The study (Wang, Yang 2012) examined the impact of collaborative filtering (the so-called recommender) on college students' use of an online forum for English learning. The forum was created with an open-source

software, Drupal, and its extended recommender module. This study was guided by three main questions: 1) Is there any difference in online behaviours between students who use a traditional forum and students who use a forum with a recommender?; 2) Is there any difference in learning motivation between students who use a traditional forum and students who use a forum with a recommender?; 3) Is there any difference in learning achievement between students who use a traditional forum and students who use a forum with a recommender? This study was a one-way quasi-experimental design where the independent variable was the type of forum (two levels: the traditional forum and the forum with recommender). The findings were as follows: 1) Students in the group with the forum recommender read online posts more frequently than the control group, and 2) students with the forum recommender outperformed their counterparts in their productive language test scores. However, there was no significant difference in learning motivation between the two groups. To enhance motivation for using the recommender, students offered their comments on how to revise the recommender, such as making the recommendation rating more personalized and explicit. This study is expected to provide empirical evidence to recommender research in education as well as broaden innovative insights into instructional recommender design.

1.3 The Use of CMS in a Library world

A lot of interest and attention has been given to the use of CMS in librarianship. Numerous publications and research have been devoted to the study of various aspects of this issue and present a positive experience.

For example, in the article (Coombs 2009) authors stressed that probably the best-known extension of *Drupal* in the library world is SOPAC, the social OPAC. Created at Ann Arbor District Library (AADL), MI, in 2007, it aimed to improve users' library experience by blending catalogue content seamlessly with the library *web site***.** SOPAC also adds next-generation catalogue features such as facets, tags, book covers, reviews, and ratings to create a richer experience for library users. This article discusses how *Drupal* can work as a flexible framework that can be used to integrate with other systems or create interactive tools for users.

As the primary source of materials in the library (Westbrook, Watkins 2012) are digitised and made available online, the focus of related library services is shifting to include new and innovative methods of digital delivery via social media, digital storytelling, and community-based and consortial image repositories. Most images on the *Web* are not of sufficient quality for most media outlets, so what happens when patrons require high-resolution

versions of images for use in their print publications or projects? Until recently, patrons at the University of Houston Libraries used a clunky, paper-based request process for high-resolution images that was frustrating for them and time-consuming for staff. The authors of this article outline how an interdepartmental team of University of Houston Libraries staff used *Drupal* to develop an automated patron request system that is modeled after online shopping cart experiences and integrates with the CONTENTdm-based University of Houston Digital Library. The article provides suggestions for libraries with digital collections about how to create a system that efficiently captures patron requests and streamlines staff delivery of high-resolution files.

Elaine Chen described the Current Trends in Library *Web Site* Redesign with CMS/*Drupal* (Elaine 2010).

The authors (Battles 2010) stresses that intranets should provide quick and easy access to organizational information. The University of Alabama Libraries' intranet was only partially satisfying this basic expectation. Librarians could use it to find forms, policies, committee assignments, and meeting minutes, but navigating the libraries' intranet was neither quick nor easy, and it was only one of multiple sources for essential internal information. The Web Services Department of the University of Alabama Libraries was responsible for directing the redesign of the intranet. Moving to the open-source *Drupal* content management system (*http://drupal.org*), Web Services launched a revamped public Web site in January 2009. The intranet was slated for a similar redesign and conversion to *Drupal* by the end of the same year. The goal was to build a site that served as a center for information for library faculty and staff, provided a stream of information to keep librarians throughout the system connected, contained personalized features based on an individual's group memberships, and created a collaborative environment for all library personnel. The new intranet is a one-stop source for internal information and includes features to promote communication, professional development, and collegiality.

During spring quarter 2008 (Peterson, Haulgren 2010), the Western Washington University (WWU) Libraries established an interactive bloglike environment called "14 Days to Have Your Say" with the intention of gathering new ideas and feedback about the libraries from the university community. The environment was developed as a fairly simple Drupal site. The project was open for direct posting from anyone on the WWU campus for 14 days, from May 7 to May 21, 2008. The study describes the background of the project and how it was developed and launched.

Since launching its first website in 1997, the Arapahoe Library District (ALD) has constantly looked at ways to review and renew this vital tool for patrons (Kiyotake 2010). This study focuses on the process of redesigning the ALD website--the steps taken and decisions made in order to create a site that incorporates interactive elements and patron input and that uses an open source content management system (Drupal). The following information starts in the present and works its way back to the beginning of ALD's website development. Founded in 1966, ALD is a library district serving Colorado's unincorporated Arapahoe County. Located south of Denver, ALD patrons hail from the suburbs to the eastern plains of the state, covering 805 square miles. Resources offered by ALD include eight branch facilities, a bookmobile service, and outreach services within a correctional facility.

The days of top-down communication and controlled internal messages at a library organization are--or should be--behind us. Modern libraries must be fluid and flexible organizations with equally nimble internal communication infrastructures in place to keep up with the fast-paced environments that have been created in these organizations (Etches-Johnson, Baird 2010). As is the case at many institutions, McMaster University Library (about 100 employees) put a great deal of effort into public-facing resources and content, while the library intranet languished as an afterthought. Static *Web* pages were haphazardly created and linked to from the *site's* index page. As the *site* grew, the lack of global navigation, search functionality, and clarity about content ownership led to a large, confusing collection of pages that was increasingly difficult to maintain. In 2009, a project was undertaken to redesign the staff intranet and implement *Drupal*, an open-source content management system, to power the new *site*. This case study outlines the issues faced with the former intranet, requirements gathering, staff feedback, and usability tests performed to inform the redesign, *site* architecture, and *Drupal* modules implemented, features and benefits of the redesigned intranet, the use of the new intranet to corral existing *Web 2.0*/social media channels, governance, evaluation, and lessons learned from the project. Future phases of the project will focus on integrating other internal communication tools used by staff in their day-to-day work, including internal file-sharing drives, staff e-mail and instant messaging platforms, meeting scheduling software, and external document sharing tools such as Google Docs.

2. REVIEW OF CMS SYSTEMS

In the publication (Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012) because of their popularity and accessibility upgrades two CMS systems: Joomla! and Drupal are presented. As the basis of use and ease of configuration and modular design allows the user to independently select parts of interest, we have decided to describe these two systems. However, bearing in mind the fact that in the market there are a lot of other CMS systems available that can serve as the basis for the creation of Web pages of various degrees of complexity, at the end of this publication we will mention a few of them. One of the main criteria for including a CMS in this list is availability on the free software basis, which means being available for free use for non-commercial purposes.

The number of free CMS systems is enormous and continues to grow. Choosing the right solution is therefore not an easy task. First of all, consideration should be given to the needs and requirements which the site will have to meet. What may be helpful in solving this dilemma is visiting the Open Source CMS website at: http://www.opensourcecms.com where you can find a description of more than five hundred content management systems (Figure 290 In: Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012).

It is worth mentioning that through this website, without the installing a given system, we can view a sample homepage created with the system and use it to log into the control panel to see what options are offered (Figure 291 In: Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012). The user needs only to click the link "Demo Main Page" or "Demo Admin Page" at the bottom of the page after selecting solutions of interest. In the other case, we enter “admin” as the user name, and the password “demo123”.

Turning now to the analysis of specific CMS systems, one should first mention WordPress, which is very popular with users. It is intended primarily for users who appreciate the speed and ease of adding new content to the page. This system works best in less complex portals due to the fact that it was designed as a platform for creating fast and efficient blogging. However, this does not reduce its educational potential. The project community is well developed, often there are new updates, and one can count on help from other users. The Wordpress project is based on modules, which means that users can freely choose interesting extensions. System configuration is very simple and in fact one can start work right after the installation process. It is worth mentioning that the entire interface is also available in Polish, which greatly facilitates the work. The graphical look of the main administrative homepage

of WordPress is illustrated on the next page (Figure 292 In: Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012).

Another system - PHP-Fusion - has a slightly smaller capacity. It will be useful for users who appreciate simplicity and ease of use. It is available in a Polish language version, which greatly increases the comfort of less experienced users.

Just like WordPress, which is discussed above, PHP-Fusion is also based on the construction of additional modules. The system is being continuously developed and enjoys support from its enthusiasts, as a result of which in the Internet there is a great Deal of information on the installation process and troubleshooting. There are also alternative templates so you can easily customize the site to suit your tastes and preferences. The graphical look of the homepage sample is shown in (Figure 290 In: Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012).

The last of the CMS systems presented in this review is the Web@all CMS. In the ranking created by visitors to the site Open Source CMS system comes second after Joomla. What receives special praise is the clear and intuitive administrative menu (Figure 294 In: Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012). The system is available in Polish. With it, you can quickly create a simple Web site, fill it with content and to enable users to develop it further.

The CMS systems presented are only a part of the wide range of CMSs available at no charge on the Internet. Every administrator should choose an appropriate CMS according to their individual needs. Table 1 on the next page can be useful in choosing the right system. On the one hand a simple and less complicated CMS will allow you to quickly create content, share information, but on the other the ability to publish multimedia content can be significantly reduced. Taking the time to familiarise oneself with a more complex system such as Joomla! Drupal will undoubtedly result in the acquisition of skills enabling the user to create a high-quality website.

Table 1.

The requirements on the server side for the CMSs listed.

CMS	Required version PHP	Required version MySQL	Modules, themes	Home page
Joomla!	5.3	5.0.4	YES	http://www.joomla.org
Drupal	5.3	5.0.15	YES	http://www.drupal.org
WordPress	5.2.4	5.0.15	YES	http://www.wordpress.org
PHP-Fusion	5.0.0	4.0.0	YES	http://www.php-fusion.org
Web@all CMS	5.0.0	5.0.0	YES	http://www.webatall.org
Mambo	4.3.0	5.0.0	YES	http://www.mamboserver.com
eXtreme-Fusion	5.2.17	5.0.0	YES	http://www.extreme-fusion.org

Source: own elaboration prepared by Staniek 2012

3. A PROPOSED SITE CONCEPT

The basic structure of an educational portal is shown below (Figure 1).

When examining the educational portal of the Faculty of Ethnology and Sciences of Education in Cieszyn, University of Silesia in Katowice, which was created as part of a research project (Staniek 2012), one should analyse all of its components carefully. The portal was built on the basis of three main classes of users in mind, offering each class completely different features. The first main group of users comprises the portal maintenance and administration staff. Their responsibility is to ensure that the website functions properly and maintenance and repairs are carried out on an on-going basis. The second category of users are "teachers" and other persons authorised to publish their content. Students make up the last, third group of users that have access to the portal. Both users who do not have accounts on the system (and may not publish materials) and registered users may access free educational materials maintained in the portal. The structure of the Erudyta portal target groups is presented below (Figure 2)

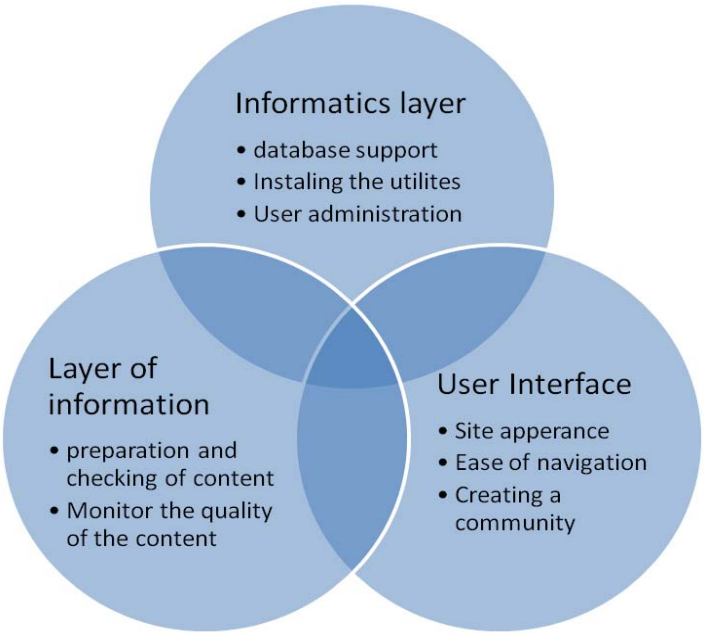

Figure 1. Layers of an educational portal.
Source: own elaboration prepared by Smyrnova-Trybulska, Staniek 2012

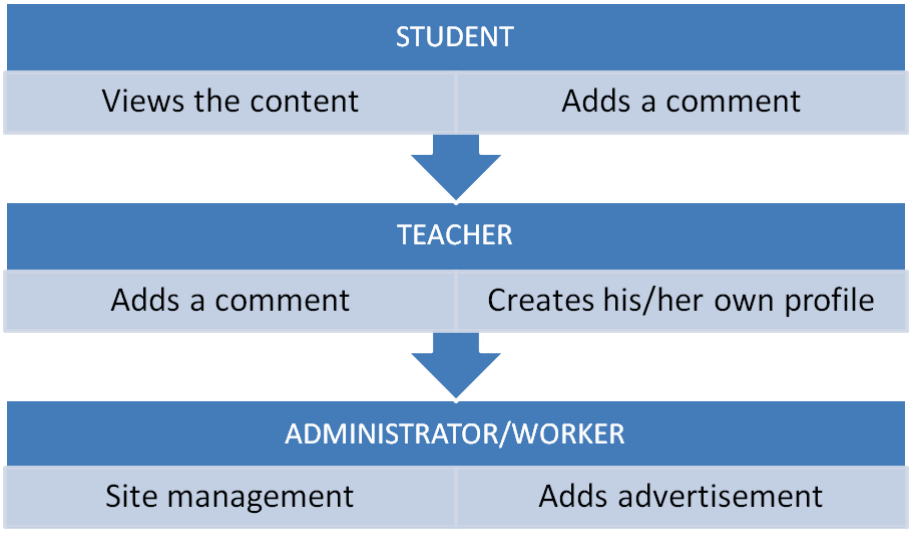

Figure 2. Target groups of the Erudyta portal.
Source: own elaboration prepared by Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012

The Erudyta educational portal is built on the basis of a navigation menu containing the following categories:

News - contains a list of the latest materials published in the portal. The content is automatically arranged according to the dates and serialized in terms of date, and popularity (number of downloads),

For the student category - three pages, which include:

• *USOS* - a link that allows the student to jump quickly to the student support system,

• *Schedule of classes* - by selecting this link student can download the proper classes schedule for their study field.

• *Announcements* - This section has been designed to improve communication with students regarding events and other items related to the course of study. Authorised university administrative staff can publish announcements related to, for example, teacher absence, necessity to amend documentation related to student practice etc.

- *Academic teachers* - this section allows them to create their personal profiles and share teaching materials with their students,
- *Links* - contains a list of links to educational websites, related to the specific character of individual courses of study etc.
- *Database of educational materials:*
  - *Multimedia*
  - *Class scenarios*
  - *Educational Videos*
  - *Educational Programs*
- *the Library* - contains links to electronic library catalogues,
- *Student self-government* body - is a place where students can publish their content,
- *Scientific circles* - contains links to third party research groups operating within the department,
- *Academic conferences* - offers viewers access to a schedule of conferences and to proceedings of the conferences already held,
- *Distance learning platform* - takes the user to the faculty's Moodle platform,
- *Galleries.*

4. SOME RESEARCH RESULTS

Designing and launching an educational portal tailored to the specific needs of the target group (pupils, students or those attending specialist courses) requires careful preparing both in terms of IT aspects involving the selection of the right CMS, as well as the skills to efficiently navigate and administer a given tool, and, last but not least, the ability to identify the preferences and the needs of those visiting the website and using its resources. An intrinsic phase of the process of implementing such solutions involves carrying out research in order to provide answers to questions about the requirements on the part of teaching material users and to the question whether or not there is demand for utilising such solutions .

The results presented below refer to the research conducted among students of the University of Silesia Faculty of Ethnology and Education Sciences in Cieszyn as part of the preparation of the Erudyta educational portal. A preliminary section of the survey research was intended to identify the information sources most frequently used by faculty students and ways in which they evaluate the credibility of information published in the portal. We will only quote and briefly discuss the most interesting results of the study that take into account the specificities of this article.

As you can see the most of the WEiNoE students will search for interesting information in the Internet; materials obtained directly from the teacher come second. The traditional way of obtaining information, which is the use of the library and its hard copy collections ranks third (Figure 3).

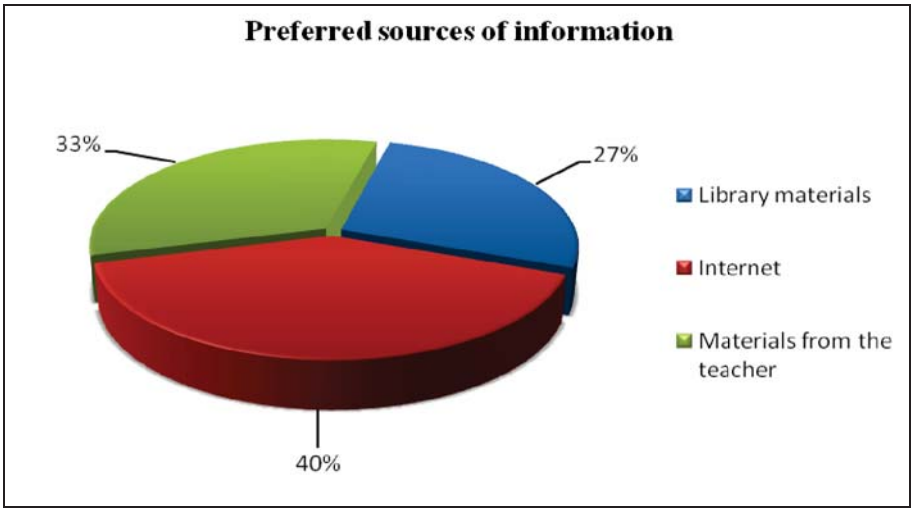

Figure 3. Preferred sources of information.
Source: own elaboration prepared by Staniek 2012

The researchers also looked into the information sources and forms of information exchange specifically on the Internet are the most popular with students (Figure 4). It is worth stressing that those surveyed showed a great deal of criticism in relation to online teaching materials whose credibility is low.

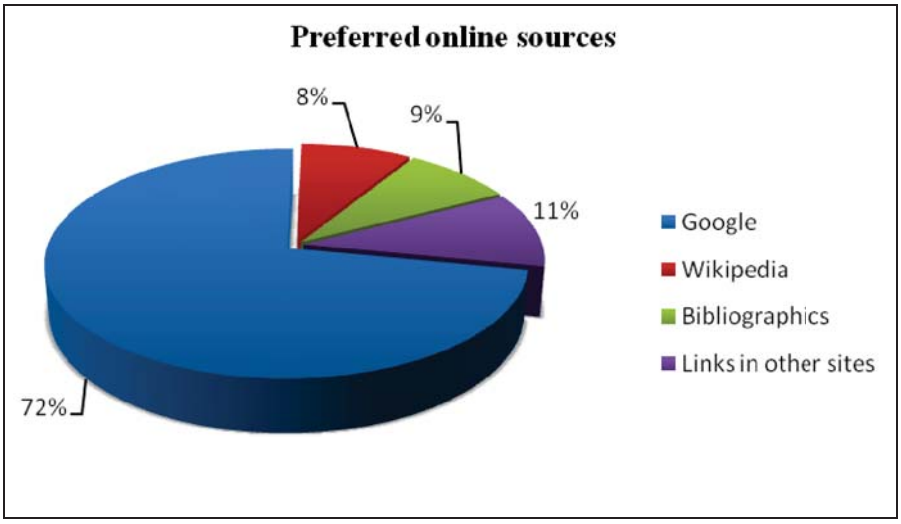

Figure 4. Preferred online sources.

Source: own elaboration prepared by Staniek 2012

The technological progress we are witnessing today, the development of IT infrastructure allowing access to the Internet from virtually anywhere in the world, coupled with the use of very popular mobile devices today encourages young people to search for teaching materials in this convenient and fast way. However, it should be remembered that in the case of the Internet, speed, quantity and availability does not always go hand in hand with high quality of the factual content available. Therefore it seems reasonable that schools, higher education institutions and other educational institutions engaged in training their employees and improving their skills are taking steps to create efficient information exchange platforms. One of the solutions to this problem is creating educational portals using free and readily available CMS systems.

The next stage of the research was to assess the level of knowledge of information technology resources used to further support the teaching-learning process among WEiNoE students. As the whole project pertained to a specific tool which is an educational portal, the students were asked about their knowledge of the essence of the tool and were also asked to provide a

definition, as well as to give the web addresses of popular educational portals which the student can recognise or uses. The results obtained indicate that there is a need for further promotion of educational portals, as only less than half of the respondents were able to correctly answer the questions (Figure 5). Nevertheless, the majority of the respondents said they believed that educational portals could be a useful tool for finding valuable and reliable teaching materials that can be used to prepare for the classes (Figure 6).

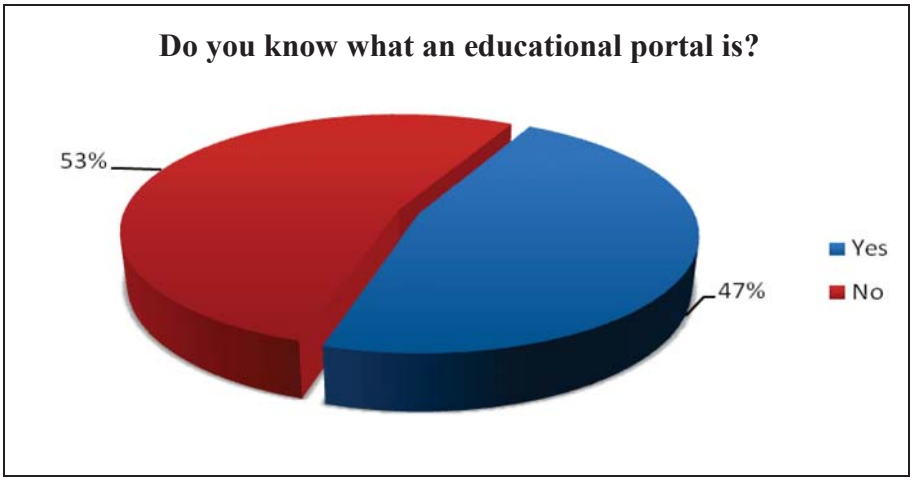

Figure 5. Do you know what an educational portal is?

Source: own elaboration prepared by Staniek 2012

The students also expressed their preference for the Erudyta faculty website which was being developed. The vast majority ticked the necessity to organize the educational portal in such a way as, on the one hand, to include quality content materials, on the other, to integrate multimedia content such as video, multimedia presentations and audio recordings.

This approach to education portals provides a strong rationale to conclude that the popularity of a source of information is increasingly determined by its multimedia-based attractive form. Providing the user with access to teaching materials in various and attractive formats seems to be a necessity. CMS systems, particularly those based on a modular structure are a really excellent tool to ensure their needs are satisfied. In the past, administrators needed extensive and specialised knowledge to integrate into the structure of a webpage video playback, real-time video conferencing or even audio materials. Today, this problem has been completely resolved, and such solutions have become available to a wide range of interested audiences, including teachers who have not attended IT training.

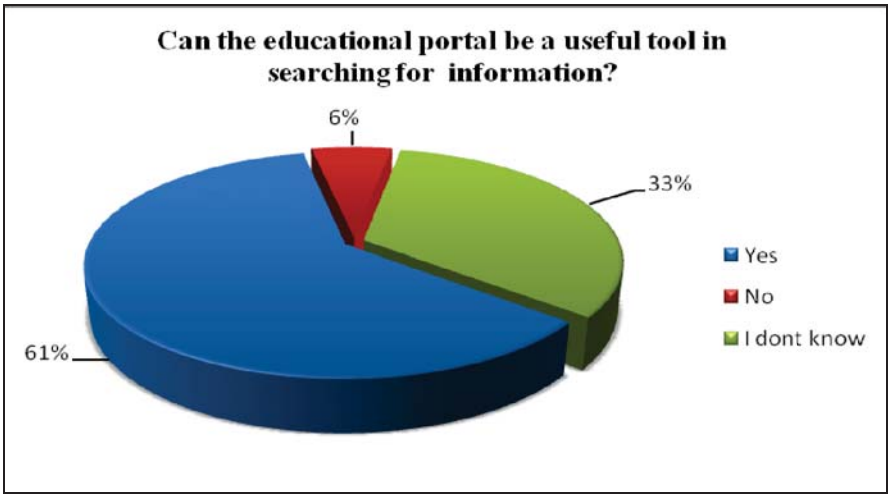

Figure 6. Can the educational portal be a useful tool in searching for information?

Source: own elaboration prepared by Staniek 2012

The students surveyed also stressed the need to ensure the copyright aspect of materials published in the educational portal is properly addressed (Figure 7). It is not without significance that the students rated highly the possibility of self-publishing their work in the educational portal and enabling communication with their academic teachers through the platform. Such an approach seems to confirm the growing sense of responsibility on the part of the students for the intellectual value as published on the Internet.

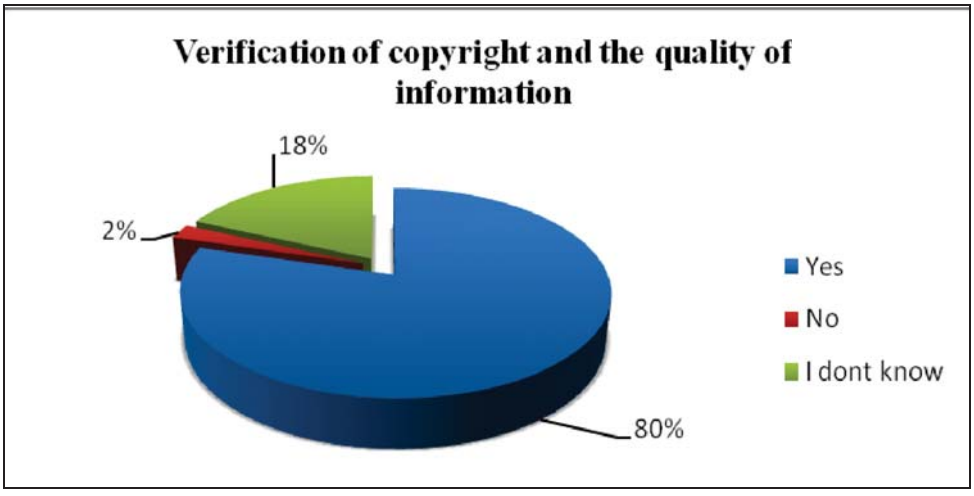

Figure 7. Verification of copyright and the quality of information.
Source: own elaboration prepared by Staniek 2012

An educational portal as a tool supplementing a distance learning platform should also meet the requirements of a very special group of users – people with disabilities. This can be done in many ways. The most popular of these is probably the removal of barriers to access, such as ensuring the possibility to change the contrast, enlarging screen font and also providing a tool reading items selected by the user . Many of these basic facilities can be implemented using the tools provided in ready-made CMS modules. An important advantage and convenience afforded by an educational portal is its independence of time and place, so that a disabled person can access its resources at any time without having to leave the house and to pay for expensive transportation etc.

Most of the students surveyed said that an educational portal is particularly useful for people with disabilities, which is a great motivation to take further steps to even better adapt the Erudyta portal to the requirements of this particular group of users (Figure 8).

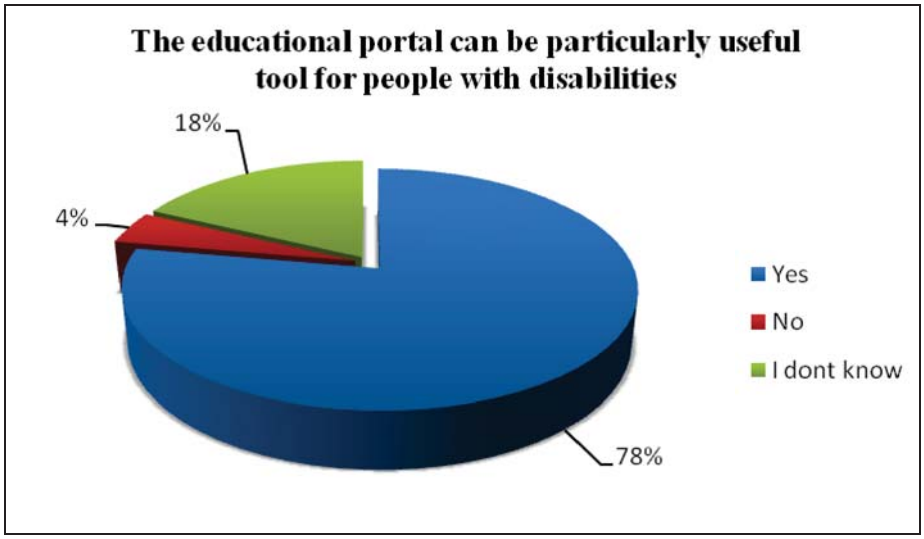

Figure 8. The educational portal can be a particularly useful tool for people with disabilities.

Source: own elaboration prepared by Staniek 2012

The multitude of available CMS solutions, as well as the increasingly evident fact that the teacher has to meet the challenges of today's changing world based primarily on modern technology mean that creating an educational portal need not be an arduous and time-consuming IT task, that it can be a simple task providing satisfaction to both the teacher and the students. In order to sum up the research carried out, it is worthwhile to provide the last

items of the data: 78% of the students said they would use the resources available on the Erudyta portal (http://www.erudyta.us.edu.pl) being created.

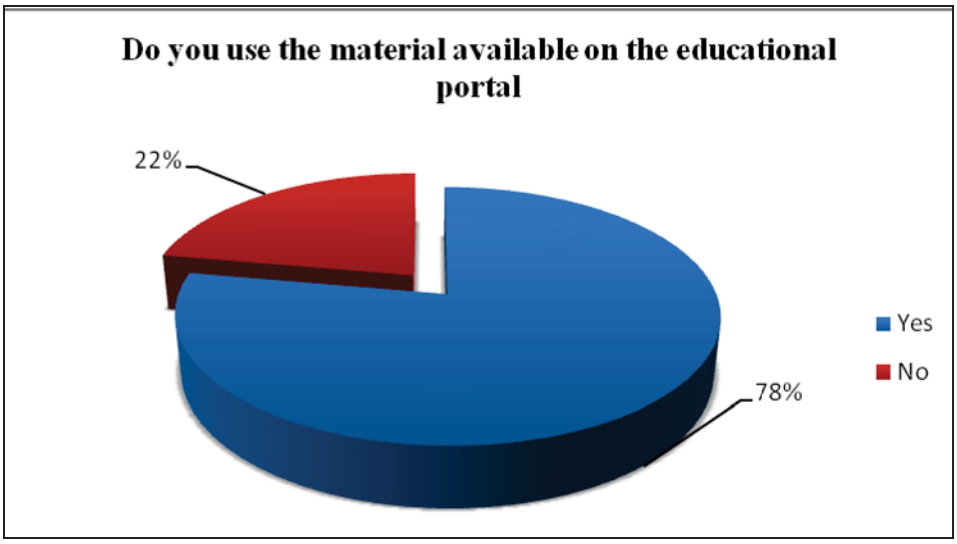

Figure 9. Do you use materials available on the educational portal.

Source: own elaboration prepared by Staniek 2012

5. ADVICE FOR DESIGNERS OF CMS-BASED PORTALS

A website designer not only has to be familiar with tools used for creating websites, but also should have a certain knowledge of website functionalities. A portal containing even very interesting information is doomed to failure if it is built without any plan or if finding information on it is too difficult. This chapter contains a few basic rules which beginner webmasters may use as guidelines (Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012).

- Every website should be made for a specific purpose and have a target audience. Websites "about everything and nothing" are doomed to failure.
- You should keep in mind the subject and target audience of the website. Putting a clown on a website about legal acts or boring colours on a website of a disco club may confuse Internet users and cause the presented content to be viewed with mistrust.
- There is no point in adding unnecessary Flash or Javascript elements to your website if they are not going to perform any specific function. Although new technologies seem to be very attractive, too many of

them or their unskillful use may effectively put people off. You should also keep in mind that every additional element on a website extends its loading time and their excess may make navigating the website more difficult.

- When building Internet portals, you should follow the three-click rule, according to which the user should be able to effortlessly access any area of the website from its other part with no more than three mouse clicks.
- It is worth remembering that each excessive graphical element extends the website's loading time. What is more, portals with fewer graphical elements are easier to index and more accessible to browsers integrated in cell phones or handheld PCs.
- The website's colours should be selected in a deliberate and consistent manner. Placing a brightly coloured text on a bright background is not the best of solutions. A blue font may be hard to make out for people with eye problems. You should also remember to be consistent with respect to the colour scheme and layout of the website. If each subpage is similar to the previous one, the user will have little difficulty in finding particular options on it, thanks to which he/she will feel much more comfortable. Naturally, not every designer needs to have a perfect feel for colour. Fortunately, you can easily find programs for selecting colours on the Internet, which are very useful tools for every webmaster.
- When constructing a website, you should always check the results of your work on main web browsers because frequently a website which looks perfect in one browser is displayed incorrectly in another. Testing the website in various environments and on various platforms as well as in different display resolutions will prevent potential errors and problems connected with the incorrect display of a website.
- When making a website, put the most important information in the first few sentences and the least significant at the end of the text. It is also good to know that multi-level headings greatly facilitate navigating the article's content.
- Conveying information can be much simpler if you use tables. You should remember, however, not to use too many colours in them because it will make them much less legible. Do not use more than four colours in tables (in extreme cases, this number may be increased to six).

- You should keep in mind that the frequent use of a bold font or capital letters in order to draw the user's attention may prove to be counterproductive: the web user will simply start ignoring them.
- Flashing and moving elements may be ignored by the user, who, as a result of sensory adaptation, may consider them to be advertising banners. That is why you should carefully think through the location and appearance of all animated elements of the portal before placing them. You should also avoid using images that look like Internet advertisements.
- You should definitely avoid creating subpages the user can go back from only by using the "back" ("Go back to the previous page") icon in the web browser. Additionally, on each subpage there should be an option to directly go back to the main page and to the area one level above.
- Keep in mind that a majority of users concentrate only on the part of the website which is shown immediately after the site has loaded and do not check its remaining content. That is why you should put all the most important information exactly in this place.
- A good practice is to include information about the size of files that can be downloaded by the user (for example films or PDF documents). Thanks to this information Internet users who also know their bandwidth will be able to determine the approximate download time.
- Although it might be tempting to create an original website, you should avoid changing the generally accepted layout of navigational elements. The user will be looking for information concerning navigating the portal in the left and upper part of the website. Changing their location may discourage Internet surfers and make them leave the site.
- Using the "you are here" option will make the navigation easier for less experienced users.
- It is a good idea to use the same images in a number of places in order to reduce the portal's loading time. Once loaded, the image stays for some time in the memory of the user's computer.
- A good idea is to use the search mechanism on all pages of the constructed website. You should keep in mind, however, that it should work only within a given portal and not search through the resources

of the entire Internet. The extension may also be used to monitor the website's most frequently searched information, thanks to which it will be possible to better highlight it.

- According to experienced webmasters, it is better to place more links leading to particular areas of the website than to minimise their number, thereby forcing the user to delve deeper into it by clicking on hyperlinks more and more frequently.
- Every website should have information about its designer in a prominent spot. Another useful tab is FAQ (Frequently Asked Questions), which will protect the webmaster from an excessive number of emails sent in by web users. However, when answering the questions, you should remember not to use a technical jargon, which is difficult to understand for a majority of Internet users.
- You should use sans-serif fonts (e.g. Verdana, Georgia, Arial), in which letters do not have decorative endings that make reading from a screen much more difficult. Moreover, using too many typefaces in one portal is not recommended. By default, one font type should be used to create headings and another for the rest of the text. You should also remember that reading a small font may be very difficult for people with eye problems.

- When setting the title of the website in <title> … </title> tags, you should keep in mind that it will be indexed under this name by web crawlers. Therefore, it is a good idea to insert a title that is relevant to the content of a given subpage between the tags.
- Avoid opening new subpages in additional windows. This causes chaos on the screen of the computer and is rather annoying to the user.
- Hyperlinks should not differ too much from the accepted pattern (underlined text), which users know well from other websites. Analogically, you should avoid underlining text which is not a hyperlink.

- Creating an image in the background significantly decreases the legibility of the website. Moreover, the appearance of images is pretty unpredictable because it depends on individual settings of each user, colour depth, the used screen, etc.
- Using a large number of empty spaces and substantial gaps between subsequent groups of information considerably improves the website's clarity and makes it easier to read. These "white spaces" on which the Internet users' gaze can stop when browsing the site reduce their weariness and allow them to rest their eyes for a while.
- One of the most frequent mistakes designers make is squeezing too much information into one webpage.
- If the website has hyperlinks in the form of icons or images, they should be selected in a way that leaves the user with no doubts as to where to click and what it will cause.
- One can note that frames are less and less frequently used in recent years. This is due to their not very aesthetic appearance and a much longer loading time of pages.
- You should definitely avoid creating the so-called "welcome pages", which direct the users to the website proper only after they have clicked on the link located on these pages. Such pages serve only to extending the loading time of the website and increase the web user's frustration.
- Always carefully think through placing advertisements on the website. They should seamlessly expand the website's content and smoothly fit in with its appearance instead of being just garish elements that obscure essential information included in the portal.
- At first, a majority of web users turn their eyes on the biggest or the most distinct element of the website, then quickly browse through the website noticing its general layout made up of the text and graphical elements, and finally begin reading specific words on the portal. Therefore, it is a good idea to design the layout of the website in a way that directs the user's eyes to the most important content.
- If the HTML/XHTML/CSS code is difficult to understand because of bad formatting (for example the whole code is inserted as a single string), it can be corrected manually, but downloading a HTML/XHTML/CSS editor, which should automatically improve the

legibility of the code by performing appropriate formatting, is a much better solution.

- When inserting images on the website, it is a good idea to choose the GIF format or interlaced PNG. Seeing them gradually appear on the monitor's screen is definitely more pleasant for the user than the ordinary loading of images.
- Changing default setting and using strong, frequently changed password may considerably improve the security of a website.
- The password should have at least one digit, one capital and small letter as well as at least one special character (for example @#$). It should not be a dictionary word or a word connected to your hobby, work, school, family, address, date of birth, etc.
- If the webmaster wishes to add a map of some place (for example from Google Maps) to his or her website, he/she needs to generate a code of this location (for example by using the http://www.map-generator.net/ tool) and paste it into a given article. Turn the editor off when inserting the map code (Smyrnova-Trybulska, Stach, Fuklin, Staniek 2012).

CONCLUSION

Information society in which we operate is a dynamic system of numerous dependencies. In these times when access to information is easy and fast, when geographical and cultural boundaries are disappearing, development, by teachers, of a friendly environment for their students in which they can expand their interests, learn and explore new possibilities, and which at the same time is customised to their needs is a great challenge.

An analysis of examples of experience and research in the field of purposeful design and use of services based on CMSs and examination of student attitudes and preferences with regard just to the web tool which is an educational portal (Staniek 2012) yield a conclusion that young generations are assimilating modern technologies. This is an important clue for teachers, for whom teaching is not just a process of transmitting information, but also stimulating student creativity and self-reliance. Adoption, in the teacher's work, of the constructivist approach to the en tire teaching process, the use of distance education as an effective form of life-long learning are but a few examples of the lines of the development of contemporary education .

When analysing the possibilities for using CMS to create an educational and information environment, one needs to emphasise the fact CMSs open up new perspectives for teachers and educators. Their use is not limited to creating websites of one type only; thanks to the availability of additional module, the only limit of their development is the creativity and imagination of administrators.

Some of the research results presented in this paper have provided a number of guidelines and pieces of advice which will make it possible to further adapt the educational portal of the Faculty of Ethnology and Sciences of Education at the University of Silesia in Cieszyn to the specific needs and requirements of students and to implement the research results on a wider scale in the creation of educational or thematic portals in Cieszyn's and Silesian Region's educational institutions.

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